covering the top of the mat, a mat portion saturating the mat, and a bottom portion covering the bottom of the mat. The top portion of the coating includes a top surface layer. At least the top surface layer of the top portion has a solar reflectance of at least 0.7 when tested by ASTM Method E903. The bottom portion of the coating has a solar reflectance less than 0.7.

In another embodiment, the roofing material is a laminated asphalt-based roofing material. The laminated roofing material includes an underlay comprising a mat saturated and coated with an asphalt-based coating. The coating includes a top portion covering the top of the mat, a mat portion saturating the mat, and a bottom portion covering the bottom of the mat. The top portion of the coating includes a top surface layer. The laminated roofing material also includes an overlay covering a portion of the top of the underlay, and leaving a portion of the underlay uncovered. The overlay comprises a layer of an asphalt-based coating, the coating layer including a top surface layer. At least the top surface layer of the overlay, and at least the top surface layer of the underlay on the uncovered portion of the underlay, are made with an asphalt having viscoelastic properties effective to prevent the coating from sticking to a coating of an adjacent shingle when the shingles are stacked face to face in a bundle and stored at a temperature exceeding 90°F (32°C). The bottom portion of the underlay coating is made with an asphalt not having the special viscoelastic properties.

In another embodiment, the roofing material comprises a mat saturated and coated with an asphalt-based coating. The coating includes a top portion covering the top of the mat, a mat portion saturating the mat, and a bottom portion covering the bottom of the mat. The top portion of the coating includes a top surface layer. A layer of granules is embedded in the top surface layer. At least the top surface layer of the top portion has an increased adhesion defined by a granule loss of less than 0.8 grams when the roofing material is soaked in water

for seven days and then tested by ASTM Method D4977. The bottom portion of the coating does not have the increased adhesion.

In another embodiment, the roofing material comprises a mat saturated and coated with an asphalt-based coating. The coating includes a top portion covering the top of the mat, a mat portion saturating the mat, and a bottom portion covering the bottom of the mat. The bottom portion of the coating has an increased toughness compared to the top portion of the coating, such that the roofing material has an increased impact resistance of at least one UL 2218 class compared to the same roofing material having a bottom portion of the coating with the same toughness as the top portion.

In another embodiment, the roofing material comprises a mat saturated and coated with an asphalt-based coating. The coating includes a top portion covering the top of the mat, a mat portion saturating the mat, and a bottom portion covering the bottom of the mat. The top portion of the coating includes a top surface layer. A layer of granules is embedded in the top surface layer. At least the top surface layer of the top portion has an increased adhesion defined by a granule loss of less than 0.8 grams when the roofing material is soaked in water for seven days and then tested by ASTM Method D4977. The roofing material further comprises a web fused to the bottom portion of the coating. The roofing material has an increased impact resistance of at least one UL 2218 class compared to the same roofing material without the web.

The process according to the invention for coating the roofing material is a continuous process of applying first and second asphalt-based coatings to a mat. The process comprises continuously moving a continuous mat along a path. The mat has a first surface and a second surface. In a first coating operation, a first asphalt-based coating is continuously applied to the first surface of the mat in a manner so that the first coating saturates the mat and forms a layer on the first surface. Then, in a second coating operation, a second asphalt-based

coating is continuously applied to the second surface of the mat in a manner so that the second coating forms a layer on the second surface. The second coating has different properties from the first coating.

In another embodiment, the invention is a continuous process of applying first and second asphalt-based coatings to a mat for manufacturing a roofing material. The process comprising continuously moving a continuous mat along a path, the mat having a first surface and a second surface. In a first coating operation, a first asphalt-based coating is continuously applied to the first surface of the mat in a manner so that the first coating saturates the mat and forms a layer on the first surface. Then, in a second coating operation, a second asphalt-based coating is continuously applied to the second surface of the mat with an applicator roll in a manner so that the second coating forms a layer on the second surface. The second coating operation includes the step of scraping the second coating from the surface of the applicator roll and smoothly applying the scraped coating to the mat. The first and second coatings can either be the same type of coating, or they can have different properties.

The invention also relates to a coating apparatus for applying first and second asphalt-based coatings to a mat for manufacturing a roofing material. The apparatus includes a pair of squeeze rolls for continuously applying a first asphalt-based coating to a first surface of the mat in a manner so that the first coating saturates the mat and forms a layer on the first surface. The apparatus also includes an applicator roll for continuously applying a second asphalt-based coating to a second surface of the mat in a manner so that the second coating forms a layer on the second surface. The apparatus further includes a metering device positioned adjacent the applicator roll with a gap therebetween, the size of the gap determining the thickness of the layer of second coating. The apparatus also includes a scraping device for scraping the second coating from the surface of the applicator roll and smoothly applying the scraped coating to the mat. The